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LEWIS, BEN	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/645,617	Applicant(s) SHIMAMURA ET AL.	
	Examiner Ben Lewis	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-5 and 9-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-5 and 9-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *22 August 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Detailed Action

1. The Applicant's amendment filed on August 16th, 2007 was received. Claims 1,3,5,9,10 and 11 were amended. Claims 2 and 6-8 were cancelled.

2. The text of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action (issued on May 17th, 2007).

Claim Rejections - 35 USC § 112

The claim rejections under 35 U.S.C. 112, second paragraph, on claims 3 and 10 are withdrawn, because the claims have been amended.

Claim Rejections - 35 USC § 103

3. Claims 1, 4 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayama et al (U.S. Patent No. 6,225,778 B1) in view of Suzuki et al. (Japanese Pub. No. 11-345599) and Furakawa (U.S. Patent No. 5,542,958) and further in view of Shiflet (U.S. Patent No. 4,233,350).

With respect to claims 1 and 9, Hayama et al disclose a battery pack wherein according to the present invention, there is provided a battery pack which comprises a flat battery cell including a flat electric power generating element, at least one armor material for sealing the flat electric power generating element, and a positive tab and a negative tab extending from the electric power generating element to the outside of the armor material through sealings of the armor material; a circuit board connected to the positive tab and the negative tab; and a container having two main walls extending along two main surfaces of the flat battery cell (Col 4 lines 33-50).

Regarding a laminate film formed by combining polymer and metal with each other, Hayama et al teach that the battery pack 20 of FIG. 7, the upper case (first case half) is not limited to that made of resin, but may be made, for example, of metal. With the upper case made of metal, a metal plate may be pressed to fabricate the first case half. Alternatively, the first case half may be cast by injection molding or the like. Metal materials used for the first case half may include aluminum, stainless steel, aluminum alloy, magnesium alloy, cold rolled steel plate, hot rolled steel plate, plated steel plate, and so on. Then, as a metal plate used for the second case half, similar metal plates to those mentioned above may be used. It should be noted that in the battery pack 20, when the first case half is made of metal, the second case half for use in combination with this must be such one that is composed of a metal plate and a resin frame attached integral with the metal plate. Alternatively, when the first case half is made of resin, the second case half may be formed only of a metal plate as is the case of FIGS. 12, 15 and 18. Resin materials suitably used for the first case half and the frame of the battery

pack 20 may be thermoplastic resin materials. For example, thermoplastic resin materials such as polycarbonate, liquid crystal polymer, a compound of polycarbonate and acrylic butadiene styrene rubber, polypropylene, polybutylene terephthalate, polyphenylene sulfide, and so on may be used (Col 18 lines 59-67); (Col 19 lines 1-16).

Regarding a power generating element formed of a plurality of electrode plates and separators, Hayama et al. teach that although the first to fifteenth embodiments each comprise a film type flat battery cell including an electric power generating element comprised of positive and negative electrodes and an electrolyte disposed therebetween, a film type flat battery cell of this invention may include, for example, an electric power generating element obtained by forming a spiral laminator into a flat shape. The spiral laminator is obtained by spirally wounding a laminator comprised of positive and negative electrodes and a separator interposed therebetween (Col 29 lines 29-40).

Regarding electrode terminal lead coupled to the electrode plate, Hayama et al teach that, a terminal base 6i having a protrusion 6h formed on the top surface and shaped complementary to the recess 6g, and leads 6c formed on the bottom surface is positioned below the sealing 4A.sub.4. Next, the circuit board 6 and the terminal base 6i are pressed into contact to sandwich the positive and negative tabs 1a, 2a between the protrusion 6h and the recessed terminals 6g to form electric connection between the flat battery cell B.sub.1 and the circuit board 6. Subsequently, the lower case 34 having windows 34d at locations corresponding to the leads 6c is prepared and attached to the upper case 32 to complete the battery pack 30 (Col 16 lines 45-58).

Regarding forming a thermally welded portion on an outer periphery of the laminate film, Hayama et al teach that the electric power generating element A is wrapped by two sheets of armor materials 4, for example, Al laminate films, where peripheral portions of the armor materials 4 are thermally fused. In FIG. 22, reference numerals $4A_1$, 4_2, $4A_3$, $4A_4$ designate four sealings of the armor materials 4 (Col 1 lines 41-50).

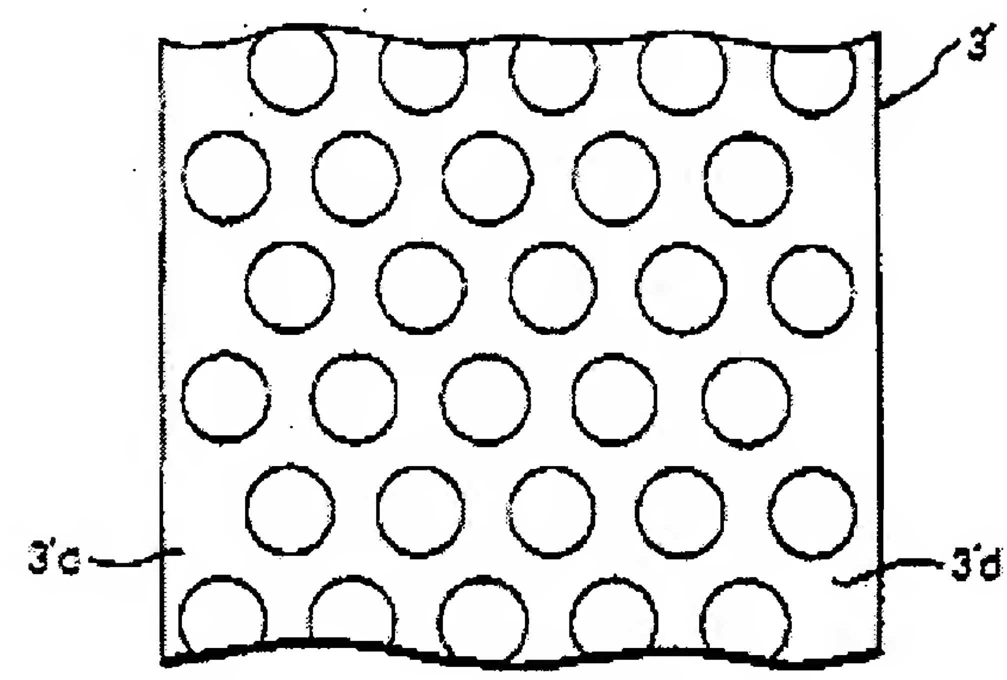
Hayama et al do not specifically teach a plurality of through holes in the electrode lead. However, Suzuki et al. disclose a sheet type electrochemical element (title) wherein, a polypropylene sheathing material is used to seal the terminals 7 and 8. The terminals 7 and 8 have through holes 11 which receive sheathing material (Paragraph 0024) (See Drawings 5 and 6). Regarding first and second rows of through holes, Suzuki et al. disclose multiple rows of through holes (See Drawing 6). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the through holes and sheathing material of Suzuki et al. into the battery of Hayama et al because Suzuki et al. teach that the through holes with sheathing material increases the tensile strength of the cell (Paragraph 0024).

Hayama et al as modified by Suzuki et al. do not specifically teach that the through holes are offset. However, Furakawa teaches a punched metal sheet used as a current collector for an electrode wherein the plurality of apertures in the punched metal sheet is arranged in a staggered fashion (see abstract and Figures 3 and 4). Furakawa also teaches that the punched metal sheet must have suitable flexibility and electrical conductivity and that the aperture rate, that is, the ratio of the total area of the

apertures to the total area of the sheet must fall within an appropriate range and that once the aperture rate is determined, a suitable aperture array arrangement in the punched metal sheet is also determined (col. 1, lines 50-59). Furakawa also teaches that a suitable arrangement of the apertures is a staggered arrangement, that is, the apertures or holes are offset from each other (col. 1, lines 59-63). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to arrange the holes in the electrode lead in an offset manner in the battery of Hayama as modified by Suzuki because the arrangement of the holes in an offset manner would give a suitable flexibility to the punched metal sheet as taught by Furakawa.

One would also be motivated to arrange the holes in the metal sheet in a staggered manner because the arrangement gives a uniform tensile strength in all directions in the plane of a sheet material as taught by Shiflet. Shiflet disclose a foraminous sheet (title) wherein the product shown in FIG. 2, having a staggered array of openings, has a substantially uniform tensile strength in all directions in the plane of the sheet, and is therefore especially desirable as a reinforcement in composite laminates (Col 5 lines 5-20) (See Fig. 2). Shiflet and Hayama et al as modified by Suzuki et al. and Furakawa are analogous art because they are from the similar problem solving area of forming a plurality of holes in a sheet of material

FIG. 4



It is noted that Furakawa teach offset holes in figure 4. above with out a gap.

With respect to claim 4, Hayama et al teach that the connection of the lands with the positive and negative tabs can be made for example by ultrasonic welding. Alternatively, the lands and the tabs may be adhered with an electrically conductive adhesive coated on connection surfaces thereof Col 15 lines 63-67).

4. Claims 5, 10, 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayama et al (U.S. Patent No. 6,225,778 B1) in view of Suzuki et al. (Japanese Pub. No.11-345599)

With respect to claim 5, 10-12, Hayama et al disclose a battery pack wherein according to the present invention, there is provided a battery pack which comprises a flat battery cell including a flat electric power generating element, at least one armor

material for sealing the flat electric power generating element, and a positive tab and a negative tab extending from the electric power generating element to the outside of the armor material through sealings of the armor material; a circuit board connected to the positive tab and the negative tab; and a container having two main walls extending along two main surfaces of the flat battery cell (Col 4 lines 33-50).

Regarding a laminate film formed by combining polymer and metal with each other, Hayama et al teach that the battery pack 20 of FIG. 7, the upper case (first case half) is not limited to that made of resin, but may be made, for example, of metal. With the upper case made of metal, a metal plate may be pressed to fabricate the first case half. Alternatively, the first case half may be cast by injection molding or the like. Metal materials used for the first case half may include aluminum, stainless steel, aluminum alloy, magnesium alloy, cold rolled steel plate, hot rolled steel plate, plated steel plate, and so on. Then, as a metal plate used for the second case half, similar metal plates to those mentioned above may be used. It should be noted that in the battery pack 20, when the first case half is made of metal, the second case half for use in combination with this must be such one that is composed of a metal plate and a resin frame attached integral with the metal plate. Alternatively, when the first case half is made of resin, the second case half may be formed only of a metal plate as is the case of FIGS. 12, 15 and 18. Resin materials suitably used for the first case half and the frame of the battery pack 20 may be thermoplastic resin materials. For example, thermoplastic resin materials such as polycarbonate, liquid crystal polymer, a compound of polycarbonate

and acrylic butadiene styrene rubber, polypropylene, polybutylene terephthalate, polyphenylene sulfide, and so on may be used (Col 18 lines 59-67); (Col 19 lines 1-16).

Regarding a power generating element formed of a plurality of electrode plates and separators, Hayama et al. teach that although the first to fifteenth embodiments each comprise a film type flat battery cell including an electric power generating element comprised of positive and negative electrodes and an electrolyte disposed therebetween, a film type flat battery cell of this invention may include, for example, an electric power generating element obtained by forming a spiral laminator into a flat shape. The spiral laminator is obtained by spirally wounding a laminator comprised of positive and negative electrodes and a separator interposed therebetween (Col 29 lines 29-40).

Regarding electrode terminal lead coupled to the electrode plate, Hayama et al teach that, a terminal base 6i having a protrusion 6h formed on the top surface and shaped complementary to the recess 6g, and leads 6c formed on the bottom surface is positioned below the sealing 4A.sub.4. Next, the circuit board 6 and the terminal base 6i are pressed into contact to sandwich the positive and negative tabs 1a, 2a between the protrusion 6h and the recessed terminals 6g to form electric connection between the flat battery cell B.sub.1 and the circuit board 6. Subsequently, the lower case 34 having windows 34d at locations corresponding to the leads 6c is prepared and attached to the upper case 32 to complete the battery pack 30 (Col 16 lines 45-58).

Regarding forming a thermally welded portion on an outer periphery of the laminate film, Hayama et al teach that the electric power generating element A is

wrapped by two sheets of armor materials 4, for example, Al laminate films, where peripheral portions of the armor materials 4 are thermally fused. In FIG. 22, reference numerals $4A_1$, 4_2, $4A_3$, $4A_4$ designate four sealings of the armor materials 4 (Col 1 lines 41-50).

Hayama et al do not specifically teach a plurality of through holes in the electrode lead. However, Suzuki et al. disclose a sheet type electrochemical element (title) wherein, a polypropylene sheathing material is used to seal the terminals 7 and 8. The terminals 7 and 8 have through holes 11 which receive sheathing material (Paragraph 0024) (See Drawings 5 and 6). Regarding first and second rows of through holes, Suzuki et al. disclose multiple rows of through holes (See Drawing 6). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the through holes and sheathing material of Suzuki et al. into the electrode lead of the battery of Hayama et al because Suzuki et al. teach that the through holes with sheathing material increases the tensile strength of the cell (Paragraph 0024).

With respect to the folding of the end of the laminate film, Hayama et al teach that the electric connection of the flat battery cell B_1 to the circuit board 6 is established by bending the positive and negative tabs 1a, 2a (only the positive tab 1a is illustrated in FIG. 6) toward a space 8' formed by the sealing $4A_4$ and the upper case 12, likewise bending the lead pieces 6f of the circuit board 6 toward the space 8', and welding the tabs and the lead pieces, as illustrated in FIG. 6 (Col 14 lines 55-67). Hayama et al does not specifically teach folding of the end of the laminate film. However, it would

have been obvious to one of ordinary skill in the art at the time the invention was made to also fold the end of the laminate film of Hayama et al. in addition to the folding of the lead and tabs because Hayama et al. teach that this folding saves space within the battery and contributes to a smaller size (Col 14 lines 55-67).

With respect to claim 13, Regarding the shape of the through holes being arcuately-shaped. To make changes in the shape of the through holes is considered obvious. In re Dailey, 357 F.2d 669, 149 USPQ 47 (CCPA 1966) (The court held that the configuration of the claimed disposable plastic nursing container was a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration of the claimed container was significant.).

5 Claims 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hayama et al (U.S. Patent No. 6,225,778 B1) in view of Suzuki et al. (Japanese Pub. No. 11-345599) and Dasgupta et al. (U.S. Patent No. 6,080,508) and further in view of Furakawa (U.S. Patent No. 5,542,958) and Shiflet (U.S. Patent No. 4,233,350).

With respect to claim 6, Hayama et al disclose a battery pack wherein according to the present invention, there is provided a battery pack which comprises a flat battery cell including a flat electric power generating element, at least one armor material for

sealing the flat electric power generating element, and a positive tab and a negative tab extending from the electric power generating element to the outside of the armor material through sealings of the armor material; a circuit board connected to the positive tab and the negative tab; and a container having two main walls extending along two main surfaces of the flat battery cell (Col 4 lines 33-50).

Regarding a laminate film formed by combining polymer and metal with each other, Hayama et al teach that the battery pack 20 of FIG. 7, the upper case (first case half) is not limited to that made of resin, but may be made, for example, of metal. With the upper case made of metal, a metal plate may be pressed to fabricate the first case half. Alternatively, the first case half may be cast by injection molding or the like. Metal materials used for the first case half may include aluminum, stainless steel, aluminum alloy, magnesium alloy, cold rolled steel plate, hot rolled steel plate, plated steel plate, and so on. Then, as a metal plate used for the second case half, similar metal plates to those mentioned above may be used. It should be noted that in the battery pack 20, when the first case half is made of metal, the second case half for use in combination with this must be such one that is composed of a metal plate and a resin frame attached integral with the metal plate. Alternatively, when the first case half is made of resin, the second case half may be formed only of a metal plate as is the case of FIGS. 12, 15 and 18. Resin materials suitably used for the first case half and the frame of the battery pack 20 may be thermoplastic resin materials. For example, thermoplastic resin materials such as polycarbonate, liquid crystal polymer, a compound of polycarbonate

and acrylic butadiene styrene rubber, polypropylene, polybutylene terephthalate, polyphenylene sulfide, and so on may be used (Col 18 lines 59-67); (Col 19 lines 1-16).

Regarding a power generating element formed of a plurality of electrode plates and separators, Hayama et al. teach that although the first to fifteenth embodiments each comprise a film type flat battery cell including an electric power generating element comprised of positive and negative electrodes and an electrolyte disposed therebetween, a film type flat battery cell of this invention may include, for example, an electric power generating element obtained by forming a spiral laminator into a flat shape. The spiral laminator is obtained by spirally wounding a laminator comprised of positive and negative electrodes and a separator interposed therebetween (Col 29 lines 29-40).

Regarding electrode terminal lead coupled to the electrode plate, Hayama et al teach that, a terminal base 6i having a protrusion 6h formed on the top surface and shaped complementary to the recess 6g, and leads 6c formed on the bottom surface is positioned below the sealing 4A.sub.4. Next, the circuit board 6 and the terminal base 6i are pressed into contact to sandwich the positive and negative tabs 1a, 2a between the protrusion 6h and the recessed terminals 6g to form electric connection between the flat battery cell B.sub.1 and the circuit board 6. Subsequently, the lower case 34 having windows 34d at locations corresponding to the leads 6c is prepared and attached to the upper case 32 to complete the battery pack 30 (Col 16 lines 45-58).

Regarding forming a thermally welded portion on an outer periphery of the laminate film, Hayama et al teach that the electric power generating element A is

wrapped by two sheets of armor materials 4, for example, Al laminate films, where peripheral portions of the armor materials 4 are thermally fused. In FIG. 22, reference numerals $4A_1$, 4_2, $4A_3$; $4A_4$ designate four sealings of the armor materials 4 (Col 1 lines 41-50).

Hayama et al do not specifically teach a plurality of through holes in the electrode lead. However, Suzuki et al. disclose a sheet type electrochemical element (title) wherein, a polypropylene sheathing material is used to seal the terminals 7 and 8. The terminals 7 and 8 have through holes 11 which receive sheathing material (Paragraph 0024) (See Drawings 5 and 6). Regarding first and second rows of through holes, Suzuki et al. disclose multiple rows of through holes (See Drawing 6). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the through holes and sheathing material of Suzuki et al. into the electrode lead of the battery of Hayama et al because Suzuki et al. teach that the through holes with sheathing material increases the tensile strength of the cell (Paragraph 0024).

Hayama et al as modified by Suzuki et al. do not specifically teach at least two laminate packaging flat cells connected in series and/or parallel. However Dasgupta et al disclose packaging assembly for a lithium battery wherein such batteries are commonly made up of several lithium battery cells connected in parallel or in series, or located between a pair of single current collector sheets with electrodes mounted on the collectors in parallel arrangement and the array of cells folded to make a single battery having only two electrical terminals (Col 7 lines 35-50). Therefore it would have been

obvious to one of ordinary skill in the art to incorporate the parallel or series arrangement of Dasgupta et al of the batteries of Hayama et al as modified by Suzuki et al. because Dasgupta et al teach that such batteries are commonly made up of several lithium battery cells connected in parallel or in series, or located between a pair of single current collector sheets with electrodes mounted on the collectors in parallel arrangement and the array of cells folded to make a single battery having only two electrical terminals (Col 7 lines 35-50).

Hayama et al as modified by Suzuki et al. and Dasgupta et al. do not specifically teach that the through holes are offset. However, Furakawa teaches a punched metal sheet used as a current collector for an electrode wherein the plurality of apertures in the punched metal sheet is arranged in a staggered fashion (see abstract and Figures 3 and 4). Furakawa also teaches that the punched metal sheet must have suitable flexibility and electrical conductivity and that the aperture rate, that is, the ratio of the total area of the apertures to the total area of the sheet must fall within an appropriate range and that once the aperture rate is determined, a suitable aperture array arrangement in the punched metal sheet is also determined (col. 1, lines 50-59). Furakawa also teaches that a suitable arrangement of the apertures is a staggered arrangement, that is, the apertures or holes are offset from each other (col. 1, lines 59-63). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to arrange the holes in the electrode lead in an offset manner in the battery of Hayama as modified by Suzuki et al. and Dasgupta et al. because the

arrangement of the holes in an offset manner would give a suitable flexibility to the punched metal sheet as taught by Furakawa.

One would also be motivated to arrange the holes in the metal sheet in a staggered manner because the arrangement gives a uniform tensile strength in all directions in the plane of a sheet material as taught by Shiflet. Shiflet disclose a foraminous sheet (title) wherein the product shown in FIG. 2, having a staggered array of openings, has a substantially uniform tensile strength in all directions in the plane of the sheet, and is therefore especially desirable as a reinforcement in composite laminates (Col 5 lines 5-20) (See Fig. 2). Shiflet and Hayama et al as modified by Suzuki et al., Dasgupta et al. and Furakawa are analogous art because they are from the similar problem solving area of forming a plurality of holes in a sheet of material

6. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayama et al (U.S. Patent No. 6,225,778 B1) in view of Suzuki et al. (Japanese Pub. No. 11-345599) and Haba (U.S. Patent No. 6,465,986 B1) and further in view of Furakawa (U.S. Patent No. 5,542,958) and Shiflet (U.S. Patent No. 4,233,350).

With respect to claims 7 and 8, Hayama et al disclose a battery pack wherein according to the present invention, there is provided a battery pack which comprises a flat battery cell including a flat electric power generating element, at least one armor material for sealing the flat electric power generating element, and a positive tab and a negative tab extending from the electric power generating element to the outside of the armor material through sealings of the armor material; a circuit board connected to the

positive tab and the negative tab; and a container having two main walls extending along two main surfaces of the flat battery cell (Col 4 lines 33-50).

Regarding a laminate film formed by combining polymer and metal with each other, Hayama et al teach that the battery pack 20 of FIG. 7, the upper case (first case half) is not limited to that made of resin, but may be made, for example, of metal. With the upper case made of metal, a metal plate may be pressed to fabricate the first case half. Alternatively, the first case half may be cast by injection molding or the like. Metal materials used for the first case half may include aluminum, stainless steel, aluminum alloy, magnesium alloy, cold rolled steel plate, hot rolled steel plate, plated steel plate, and so on. Then, as a metal plate used for the second case half, similar metal plates to those mentioned above may be used. It should be noted that in the battery pack 20, when the first case half is made of metal, the second case half for use in combination with this must be such one that is composed of a metal plate and a resin frame attached integral with the metal plate. Alternatively, when the first case half is made of resin, the second case half may be formed only of a metal plate as is the case of FIGS. 12, 15 and 18. Resin materials suitably used for the first case half and the frame of the battery pack 20 may be thermoplastic resin materials. For example, thermoplastic resin materials such as polycarbonate, liquid crystal polymer, a compound of polycarbonate and acrylic butadiene styrene rubber, polypropylene, polybutylene terephthalate, polyphenylene sulfide, and so on may be used (Col 18 lines 59-67); (Col 19 lines 1-16).

Regarding a power generating element formed of a plurality of electrode plates and separators, Hayama et al. teach that although the first to fifteenth embodiments

each comprise a film type flat battery cell including an electric power generating element comprised of positive and negative electrodes and an electrolyte disposed therebetween, a film type flat battery cell of this invention may include, for example, an electric power generating element obtained by forming a spiral laminator into a flat shape. The spiral laminator is obtained by spirally wounding a laminator comprised of positive and negative electrodes and a separator interposed therebetween (Col 29 lines 29-40).

Regarding electrode terminal lead coupled to the electrode plate, Hayama et al teach that, a terminal base 6i having a protrusion 6h formed on the top surface and shaped complementary to the recess 6g, and leads 6c formed on the bottom surface is positioned below the sealing $4A_4$. Next, the circuit board 6 and the terminal base 6i are pressed into contact to sandwich the positive and negative tabs 1a, 2a between the protrusion 6h and the recessed terminals 6g to form electric connection between the flat battery cell B.sub.1 and the circuit board 6. Subsequently, the lower case 34 having windows 34d at locations corresponding to the leads 6c is prepared and attached to the upper case 32 to complete the battery pack 30 (Col 16 lines 45-58).

Regarding forming a thermally welded portion on an outer periphery of the laminate film, Hayama et al teach that the electric power generating element A is wrapped by two sheets of armor materials 4, for example, Al laminate films, where peripheral portions of the armor materials 4 are thermally fused. In FIG. 22, reference numerals $4A_1$, 4_2, $4A_3$, $4A_4$ designate four sealings of the armor materials 4 (Col 1 lines 41-50).

Hayama et al do not specifically teach a plurality of through holes in the electrode lead. However, Suzuki et al. disclose a sheet type electrochemical element (title) wherein, a polypropylene sheathing material is used to seal the terminals 7 and 8. The terminals 7 and 8 have through holes 11 which receive sheathing material (Paragraph 0024) (See Drawings 5 and 6). Regarding first and second rows of through holes, Suzuki et al. disclose multiple rows of through holes (See Drawing 6). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the through holes and sheathing material of Suzuki et al. into the electrode lead of the battery of Hayama et al because Suzuki et al. teach that the through holes with sheathing material increases the tensile strength of the cell (Paragraph 0024).

Hayama et al as modified by Suzuki et al. do not specifically teach at least two battery modules connected in series and/or parallel. However Haba disclose a battery network with compounded interconnections wherein The EV1, for example, includes a battery pack consisting of 26 Valve-Regulated Lead Acid (VRLA) modules electrically connected together in a single series string for an available voltage of 312 Volts and a storage capacity of about 16.3 kW (Col 1 lines 25-40).

Therefore it would have been obvious to one of ordinary skill in the art to incorporate the parallel or series arrangement of battery modules of Haba of the batteries of Hayama et al as modified by Suzuki et al. because Haba et al teach that although the described embodiment of the battery operating system is a 120V, 48A battery pack, it should be realized that the battery pack may alternatively be configured,

within the scope of this invention, to have different ratings and/or capacity. For example, lithium-ion or lithium-ion solid polymer batteries with different ratings may be used for savings in weight and size and increase in energy (Col 5 lines 31-52).

Hayama et al as modified by Suzuki et al. and Habai et al. do not specifically teach that the through holes are offset. However, Furakawa teaches a punched metal sheet used as a current collector for an electrode wherein the plurality of apertures in the punched metal sheet is arranged in a staggered fashion (see abstract and Figures 3 and 4). Furakawa also teaches that the punched metal sheet must have suitable flexibility and electrical conductivity and that the aperture rate, that is, the ratio of the total area of the apertures to the total area of the sheet must fall within an appropriate range and that once the aperture rate is determined, a suitable aperture array arrangement in the punched metal sheet is also determined (col. 1, lines 50-59). Furakawa also teaches that a suitable arrangement of the apertures is a staggered arrangement, that is, the apertures or holes are offset from each other (col. 1, lines 59-63). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to arrange the holes in the electrode lead in an offset manner in the battery of Hayama as modified by Suzuki et al. and Habai et al. because the arrangement of the holes in an offset manner would give a suitable flexibility to the punched metal sheet as taught by Furakawa.

One would also be motivated to arrange the holes in the metal sheet in a staggered manner because the arrangement gives a uniform tensile strength in all directions in the plane of a sheet material as taught by Shiflet. Shiflet disclose a

foraminous sheet (title) wherein the product shown in FIG. 2, having a staggered array of openings, has a substantially uniform tensile strength in all directions in the plane of the sheet, and is therefore especially desirable as a reinforcement in composite laminates (Col 5 lines 5-20) (See Fig. 2). Shiflet and Hayama et al as modified by Suzuki et al. , Habai et al. and Furakawa are analogous art because they are from the similar problem solving area of forming a plurality of holes in a sheet of material

Response to Arguments

7. Applicant's arguments filed on August 16th, 2007 have been fully considered but they are not persuasive.

Applicant's principal arguments are

(a) The combination of Hayama et al., Suzuki et al., Furukawa, and Shiflet do not suggest the claimed laminate packaging flat cell and method for manufacturing a laminate packaging flat cell because neither Hayama et al., Suzuki et al., Furukawa, and Shiflet, whether taken alone, or in combination, suggest that the through-holes form first and second rows along a widthwise direction of the electrode terminal lead that is substantially perpendicular to the protruding direction, and the through-holes in the first row are arranged to offset to the through-holes in the second row without a gap in the widthwise direction when viewed along the protruding direction, as required by claims 1 and 9.

(b) The combination of Hayama et al. and Suzuki et al. do not suggest the claimed laminate packaging flat cell because neither Hayama et al. nor Suzuki et al., alone or in combination, suggest that the through-holes are arranged to prevent leakage of electrolyte linearly along the protruding direction through a location of the thermally welded portion of the laminate film where the terminal electrode lead protrudes, as required by claim 10.

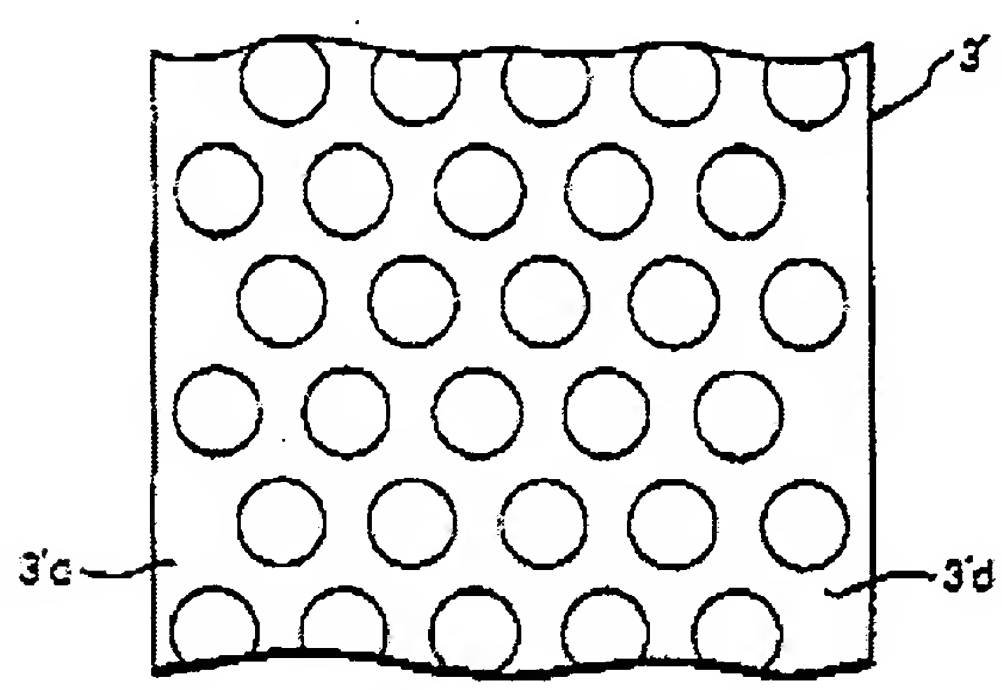
In response to Applicant's arguments, please consider the following comments.

(a) Hayama et al as modified by Suzuki et al. do not specifically teach that the through holes are offset. However, Furakawa teaches a punched metal sheet used as a current collector for an electrode wherein the plurality of apertures in the punched metal sheet is arranged in a staggered fashion (see abstract and Figures 3 and 4). Furakawa also teaches that the punched metal sheet must have suitable flexibility and electrical conductivity and that the aperture rate, that is, the ratio of the total area of the apertures to the total area of the sheet must fall within an appropriate range and that once the aperture rate is determined, a suitable aperture array arrangement in the punched metal sheet is also determined (col. 1, lines 50-59). Furakawa also teaches that a suitable arrangement of the apertures is a staggered arrangement, that is, the apertures or holes are offset from each other (col. 1, lines 59-63). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to arrange the holes in the electrode lead in an offset manner in the battery of Hayama as modified by

Suzuki because the arrangement of the holes in an offset manner would give a suitable flexibility to the punched metal sheet as taught by Furakawa.

One would also be motivated to arrange the holes in the metal sheet in a staggered manner because the arrangement gives a uniform tensile strength in all directions in the plane of a sheet material as taught by Shiflet. Shiflet disclose a foraminous sheet (title) wherein the product shown in FIG. 2, having a staggered array of openings, has a substantially uniform tensile strength in all directions in the plane of the sheet, and is therefore especially desirable as a reinforcement in composite laminates (Col 5 lines 5-20) (See Fig. 2). Shiflet and Hayama et al as modified by Suzuki et al. and Furakawa are analogous art because they are from the similar problem solving area of forming a plurality of holes in a sheet of material

FIG. 4



It is noted that Furakawa teach offset holes in figure 4. above with out a gap.

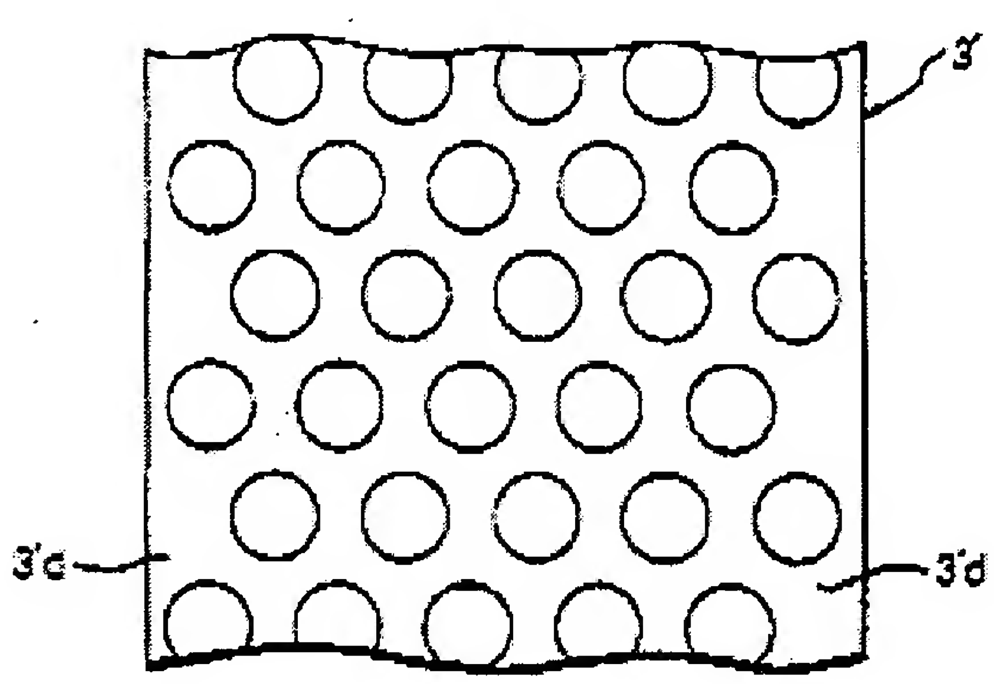
(b) In response to applicant's argument that "neither Hayama et al. nor Suzuki et al., alone or in combination, suggest that the through-holes are arranged to prevent leakage of electrolyte linearly along the protruding direction through a location of the thermally welded portion of the laminate film where the terminal electrode lead protrudes", a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim.

Examiner notes that Hayama et al as modified by Suzuki et al. do not specifically teach that the through holes are offset. However, Furakawa teaches a punched metal sheet used as a current collector for an electrode wherein the plurality of apertures in the punched metal sheet is arranged in a staggered fashion (see abstract and Figures 3 and 4). Furakawa also teaches that the punched metal sheet must have suitable flexibility and electrical conductivity and that the aperture rate, that is, the ratio of the total area of the apertures to the total area of the sheet must fall within an appropriate range and that once the aperture rate is determined, a suitable aperture array arrangement in the punched metal sheet is also determined (col. 1, lines 50-59). Furakawa also teaches that a suitable arrangement of the apertures is a staggered arrangement, that is, the apertures or holes are offset from each other (col. 1, lines 59-63). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to arrange the holes in the electrode lead in an offset manner in the battery of Hayama as modified by Suzuki because the arrangement of the holes in

an offset manner would give a suitable flexibility to the punched metal sheet as taught by Furakawa.

One would also be motivated to arrange the holes in the metal sheet in a staggered manner because the arrangement gives a uniform tensile strength in all directions in the plane of a sheet material as taught by Shiflet. Shiflet disclose a foraminous sheet (title) wherein the product shown in FIG. 2, having a staggered array of openings, has a substantially uniform tensile strength in all directions in the plane of the sheet, and is therefore especially desirable as a reinforcement in composite laminates (Col 5 lines 5-20) (See Fig. 2). Shiflet and Hayama et al as modified by Suzuki et al. and Furakawa are analogous art because they are from the similar problem solving area of forming a plurality of holes in a sheet of material

FIG. 4



It is noted that Furakawa teach offset holes in figure 4. above with out a gap.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ben Lewis whose telephone number is 571-272-6481. The examiner can normally be reached on 8:30am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Ben Lewis

Patent Examiner
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PATRICK JOSEPH RYAN
SUPERVISORY PATENT EXAMINER